Description

Method and telecommunications device for transmitting service messages to a service center and receiving service messages from a service center

The present invention relates to a method for transmitting service messages to a service center and receiving service messages from a service center according to the pre-characterizing clause of Claim 1, and to a telecommunications device for transmitting service messages to a service center and receiving service messages from a service center according to the pre-characterizing clause of Claim 10.

The transmission (sending and receiving) of service messages to a telecommunications device - such as a mobile telephone, a cordless telephone comprising a base station and at least one handset, a fixed network telephone, etc. - and vice versa is a communications service which must be distinguished in respect of the information content transmitted with the messages and which initially emerged in the mobile network area and, because of the high level of acceptance, has now also gradually established itself in the fixed network area. Of the plethora of services provided in the mobile radio network - such as the "Short Message (Messaging) Service(SMS)", the "Enhanced Message (Messaging) Service (EMS)", the "Multimedia Message (Messaging) Service (MMS)", "Instant Messaging", "Over The Air Activation (OTA)", e-mail, etc. - the trend in both the fixed and the mobile network currently appears to be towards a greater role for the SMS and MMS communication services in particular. Whereas the SMS service has already been standardized for both the mobile and the fixed network area (for GSM: ETSI TS 100 942 V7. 0.0, Release 1998; for ISDN/PSTN: ETSI ES 201 912 V1.1.1, Release 01/2002), for the MMS service this applies only to the

mobile radio area, while standardization activities are currently underway in the fixed network area.

The SMS service in the fixed and mobile network is a point-to-point service characterized by purely push functionality, i.e. the content of the Short Message (SM) with a maximum length of 160 bytes is sent by the Short Message Service Center (SMSC) to the telecommunications device, with call setup being initiated by the service center. Whereas the SMS service operates on a connectionless basis in the mobile radio area between the telecommunications device and the Short Message Service Center, the short message being transmitted via a signaling channel without a circuit connection being established, in the fixed network the SMS service is handled on a connection-oriented basis whereby a circuit connection between the telecommunications device and the Short Message Service Center is established over which the short message is conveyed by means of implementation of the "Calling Line Identification (CLI)" feature known as "Calling Line Identification Presentation (CLIP)" using FSK and/or DTMF signaling (Frequency Shift Keying/Dual Tone Multiple Frequency).

On the other hand, in the case of the MMS service which in the mobile radio network is handled like the SMS service on a connectionless basis via a WAP transport path (using the Wireless Application Protocol), a different mechanism is employed in the fixed network: when a Multimedia Message (MM) whose size is in principle unlimited but is currently restricted to approximately 100 kbytes is sent to the telecommunications device, a notifying message, the so-called MMS Notification, is first sent, again on a connection-oriented basis, to inform the telecommunications device that a multimedia message is present at the Multimedia Message Service Center (MMSC). This takes place via a push service such as the

SMS service. In contrast to receiving a short message, another call setup must then be initiated from the telecommunications device to the Multimedia Message Service Center in order to receive the content of the multimedia message.

Both the SMS service and the MMS service offer solutions for downloading information content, e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc. which is either stored in the relevant Service Center or can be made available by the Service Center through outsourcing.

It will now be shown, representatively for the SMS and MMS service in the mobile radio area and for the MMS service in the fixed network area, how a downloading scenario of this kind based on the message type defined in Annex B to Protocol 2 of ETSI Standard "ETSI ES 912 V1.1.1, Release 01/2002" currently operates according to the prior art for the SMS service in the fixed network area, with reference to FIGURES 1 to 3 in which:

FIGURE 1 shows a message flowchart for the requesting of information content by a telecommunications device from a service center, in particular a Short Message Service Center,

FIGURE 2 shows a message flowchart for the delivery of the information content requested according to FIGURE 1 to the telecommunication device by the service center, in particular the Short Message Service Center,

FIGURE 3 shows the basic design of the telecommunications device both for requesting the information content from the service center, in particular the Short Message Service Center, according to FIGURE 1 via a fixed network, and for delivery of the requested information content to the telecommunications

device by the service center, in particular the Short Message Service Center, according to FIGURE 2 via the fixed network.

FIGURE 1 shows with reference to a message flowchart how a telecommunications device TKG' according to the prior art requests information content - e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc. - from a service center SZ', in particular a Short Message Service Center. For this purpose the telecommunications device TKG' first sets up a call to the service center SZ'. To this end it transmits a first message M0 with message content "CALL SETUP" to the service center SZ'. On receiving this first message M0, the service center SZ' assumes a first operating state "OFF-HOOK".

In this operating state the service center SZ' then transmits a second message M1 with message content "DLL_SMS_EST" (Data Link Layer_Short Message Service_ESTablished) to the telecommunications device TKG', thereby initiating a first session SI1. With the second message M1 the service center SZ' notifies the telecommunications device TKG' that a DLL (Data Link Layer) connection exists.

In the first session SI1, on receiving the second message M1, the telecommunications device TKG' transmits a first service message SN1, in particular a short message, to the service center SZ' using a third message M2 and message content "DLL_SMS_DATA[SUBMIT]" (Data Link Layer_Short Message Service_DATA[SUBMIT]). With this first service message SN1 the telecommunications device TKG' requests from the service center SZ' quite specific information content required by the user of the telecommunications device TKG - e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc.

To acknowledge that it has received the first service message SN1 from the telecommunications device TKG', the service center SZ' sends a fourth message M3 with message content "DLL_SMS_ACK[SUBMIT_REP]" (Data Link Layer_Short Message Service_ACKnowledge[SUBMIT_REPeated]) to the telecommunications device TKG'. In this fourth message M3 the content of the first service message SN1 is sent back by the service center SZ' as a repetition to acknowledge receipt of the first service message SN1. In this way the telecommunications device TKG' can check whether the first service message SN1 sent with the third message M2 has been completely and correctly received by the service center SZ'.

If this is the case, this completes the requesting of information content performed with the third message M2. Otherwise, the first service message SN1 transmitted with the third message M2 is re-transmitted. If this transmission attempt also fails, the telecommunications device TKG' has two options (not shown in FIGURE 1):

Either it attempts to re-transmit until transmission has been successful or it aborts the transmission procedure. The result of the latter is that the telecommunications device TKG' cannot request the information content in the current first session SI1 and, if required, it must initiate a completely new procedure encompassing the first session SI1 (request session) immediately after aborting or with a time delay.

When the telecommunications device TKG' has ascertained that the sent first service message SN1 has been completely and correctly received by the service center SZ', the telecommunications device TKG' sends a fifth message M4 with message content "DLL_SMS_REL" (Data Link Layer_Short Message

Service_RELease) to the service center SZ'. With this fifth message M4, the first session SI1 is released by the telecommunications device TKG'. After transmission of the fifth message M4, which therefore closes the first session SI1, both the service center SZ' and the telecommunications device TKG' assume a second operating state "ON-HOOK", thereby clearing down the existing call and terminating the requesting of information content by the telecommunications device TKG' according to the prior art.

FIGURE 2 shows with reference to a message flowchart how the service center SZ', in particular the Short Message Service Center, delivers the information content requested by the telecommunications device TKG' as shown in FIGURE 1 to the telecommunications device TKG' according to the prior art. For this purpose, the service center SZ' first transmits another first message M0' again with message content "CALL SETUP" to the telecommunications device TKG', causing the service center SZ' to set up a call to the telecommunications device TKG'. As a result of this call setup, the telecommunications device TKG' then assumes the first operating state "OFF-HOOK".

In this operating state, the telecommunications device TKG' then transmits a sixth message M5 with the same message content "DLL_SMS_EST" (Data Link Layer_Short Message Service_ESTablished) as in the second message M1 in FIGURE 1 to the telecommunications device TKG', thereby initiating a second session SI2. With the sixth message M5, the telecommunications device TKG' informs the service center SZ' that a DLL (Data Link Layer) connection exists.

In the second session SI2, on receiving the sixth message M5, the service center SZ' transmits a second service message SN2, in particular again a short message, to the telecommunications

device TKG' using a seventh message M6 and message content "DLL_SMS_DATA[DELIVER]" (Data Link Layer_Short Message Service_DATA[DELIVER]). With this second service message SN2, the service center SZ' delivers the information content requested by the telecommunications device TKG' - e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc.

If the service center SZ' does not have the information content requested by the telecommunications device TKG' (this eventuality is not shown in FIGURE 2), instead of the seventh message M6 it transmits a warning to the telecommunications device TKG', informing the device of this fact and announcing that the existing second session SI2 will be released and the call terminated.

To acknowledge that it has received the second service message SN2 from the service center SZ', the telecommunications device TKG' sends an eighth message M7 with message content "DLL_SMS_ACK[DELIVER_REP]" (Data Link Layer_Short Message Service_ACKnowledge[DELIVER_REPeated]) to the service center SZ'. In this eighth message M7 the content of the second service message SN2 is sent back by the telecommunications device TKG' as a repetition to acknowledge receipt of the second service message SN2. In this way the service center SZ' can check whether the second service message SN2 sent with the seventh message M6 has been completely and correctly received by the telecommunications device TKG'.

If this is the case, this completes the transmission of information content initiated with the seventh message M6. Otherwise, the second service message SN2 transmitted with the seventh message M6 is re-transmitted. If this transmission attempt also fails, the service center SZ' has two options (not

shown in FIGURE 2):

Either it attempts to re-transmit until transmission has been successful or it aborts the transmission procedure. The result of the latter is that the telecommunications device TKG' has not received the requested information content in the current second session SI2 and, if required, it must initiate a completely new procedure encompassing the first session SI1 (request session) and the second session SI2 (delivery session) immediately after aborting or with a time delay.

If the amount of information content to be delivered is so large that a second service message SN2 is insufficient, in terms of the maximum capacity transmittable with the message, to transit the information content to be delivered, the partial delivery handled with the seventh message M6 and the eighth message M7 is repeated until the service center SZ' has transmitted the second service message SN2 in the second session SI2 with a ninth message M8 and message content "DLL_SMS_DATA[DELIVER]" (Data Link Layer_Short Message Service_DATA[DELIVER]) for the last time for the complete delivery of the information content and until the telecommunications device TKG' has sent a tenth message M9 with message content "DLL_SMS_ACK[DELIVER_REP]" (Data Link Layer_Short Message Service_ACKnowledge[DELIVER_REPeated]) to the service center SZ' to confirm that it has received the last second service message SN2 from the service center SZ'.

In this tenth message M9, as in the eighth message M7, the content of the last second service message SN2 is sent back as a repetition. In this way the service center SZ' can now finally check whether the second service message SN2 last transmitted by the telecommunications device TKG' with the ninth message M8 has likewise been completely and correctly

received.

If this is the case, the information content transmission begun with the seventh message M6 is complete. If not, the second service message SN2 last transmitted with the ninth message M8 is transmitted once again. If this transmission attempt also fails, the service center SZ' has two options (not shown in FIGURE 2):

Either it attempts to re-transmit until transmission has been successful or it aborts the transmission procedure. The result of the latter is that the telecommunications device TKG' has not completely (only partially) received the requested information content in the current second session SI2 and, if required, it must initiate a completely new procedure encompassing the first session SI1 (request session) and the second session SI2 (delivery session) immediately after aborting or with a time delay.

When the service center SZ' has established that the transmitted second service message SN2 has been completely and correctly received by the telecommunications device TKG', the service center SZ' sends an eleventh message M10 with the same message content "DLL_SMS_REL" (Data Link Layer_Short Message Service_RELease) as in the fifth message M4 in FIGURE 1 to the telecommunications device TKG'. With this eleventh message M10, the second session SI2 is released by the service center SZ'. After transmission of the eleventh message M10, which therefore closes the second session SI2, both the service center SZ' and the telecommunications device TKG' assume the second operating state "ON-HOOK". This causes the set-up call to be cleared down again and delivery by the service center SZ' of the message content requested by the telecommunications device TKG' is complete according to the prior art.

FIGURE 3 shows the basic design of the telecommunications device TKG' on the one hand for requesting information content from the service center SZ', in particular the Short Message Service Center, according to FIGURE 1 via e.g. a Public Switched Telephone Network (PSTN) or fixed network FN implemented as an Integrated Services Digital Network (ISDN) and, on the other hand, for delivery of the requested information content to the telecommunications device TKG' by the service center SZ' according to FIGURE 2 via the fixed network FN.

In order that the telecommunications device TKG' can transmit (send and receive) the messages M0, M0', M1...M10 and the first service message SN1 shown in FIGURES 1 and 2, the telecommunications device TKG' has a central control device ZSE for controlling the functional and operational sequences in the telecommunications device TKG', a user interface BSS and a telecommunications device/service center interface TSSS. The user interface BSS comprises e.g. the typical operating surface for telecommunications devices, consisting of a keypad, a display and electroacoustic transducers for voice input and voice output. The telecommunications device/service center interface TSSS and the user interface BSS are each connected to the central control device ZSE. The telecommunications device/service center interface TSSS additionally has sending means SM and receiving means EM which are likewise connected to the central control device ZSE and via which the telecommunications device TKG' is connected to the service center SZ' via the fixed network FN.

If the user of the telecommunications device TKG' wishes to call up and download user-specific information content such as texts, multimedia content, i.e. audio/video data, graphics,

programs, etc. from the service center SZ', he enters appropriate download-initiating commands on the user interface BSS and generates the first service message SN1, e.g. a short message, via the operating surface of the user interface BSS. These commands and the first service message SN1 are interpreted by the central control device ZSE. If the central control device ZSE detects on the basis of this interpretation of the commands and the first service message SN1 that the user of the telecommunications device TKG' wishes to set up a telecommunications call TKV to the service center SZ', the telecommunications device/service center interface TSSS and in particular the sending means SM in this interface are activated by the central control device ZSE in such a way that initially the first message M0 is transmitted via the fixed network FN to the service center SZ', causing the telecommunications call TKV required by the user of the telecommunications device TKG' to be set up according to FIGURE 1.

Via this set-up telecommunications call TKV, the messages M1...M4 shown in FIGURE 1 and corresponding to the first session SI1, including the generated first service message SN1, are then transmitted between the telecommunications device TKG' and the service center SZ' in the sequence and transmission direction illustrated. For this purpose, depending on which message and whether the first service message SN1 is to be transmitted (sent or received), either the sending means SM or the receiving means EM in the telecommunications device/service center interface TSSS are connected to the service center SZ' by line connection by the central control device ZSE in the telecommunications device TKG'.

If the messages M1... M4 and the first service message SN1 corresponding to the first session SI1 have been transmitted completely and correctly, the checking possibly required for

this purpose on the part of the telecommunications device TKG', including generation of the acknowledgment message, being performed in the central control device ZSE, and if therefore both the first session SI1 is released and finally the telecommunications call TKV between the telecommunications device TKG' and the service center SZ' is cleared down as detailed in FIGURE 1, delivery of the information content requested by the user of the telecommunications device TKG' by the service center SZ' according to FIGURE 2 can now commence.

For this purpose the service center SZ' sets up, with a time delay, another telecommunications call TKV to the telecommunications device TKG'. To this end it sends the further first message M0' to the telecommunications device TKG' as shown in Figure 2. Via this set-up telecommunications call TKV', the messages M5...M10 shown in Figure 2 and corresponding to the second session SI2, including the second service message SN2 generated by the service center SZ', are then transmitted between the telecommunications device TKG' and the service center SZ' in the sequence and transmission direction illustrated. For this purpose, depending on which message is to be transmitted (sent or received) and whether the second service message SN2 is being transmitted, either the sending means SM or the receiving means EM in the telecommunications device/service center interface TSSS are connected to the service center SZ' by line connection by the central control device ZSE in the telecommunications device TKG'.

If the messages M5... M10 and the second service message SN2 corresponding to the second session SI2 have been transmitted completely and correctly, the checking on the part of the telecommunications device TKG', including generation of the acknowledgment message, possibly required for this purpose being performed in the central control device ZSE, and if

therefore both the second session SI2 is released and finally the telecommunications call TKV' between the telecommunications device TKG' and the service center SZ' is cleared down as detailed in FIGURE 2, downloading (requesting and delivering) of the information content required by the user of the telecommunications device TKG' is terminated or complete.

The basic object of the invention consists in specifying a method and telecommunications device for transmitting service messages to a service center and receiving service messages from a service center, wherein the downloading of downloadable information content directly or indirectly available in the service center is improved with a view to ensuring in a simple manner that each person who initiates downloading also bears the costs for the downloaded information content and that the service center does not necessarily need to know or ascertain that person's directory number for transporting the information content.

This object is achieved on the basis of the method defined in the pre-characterizing clause of Claim 1 by the features set forth the characterizing part of Claim 1.

This object is additionally achieved on the basis of the telecommunications device defined in Claim 10 by the features set forth in the characterizing part of Claim 10.

The fundamental idea of the invention is that a telecommunications device sets up a telecommunications call to a service center and that, during this call, the telecommunications device both requests the information content from the service center in a first session (request session) with a first service message and receives the information content from the service center in a second session (delivery

session) with at least one second service message, i.e. without another telecommunications call having to be set up as in the prior art.

For the SMS service in the fixed network this means that the "Short Message Service (SMS)" specified in ETSI publication "ETSI ES 201 912 V1.1.1, Release 01/2002" is extended in respect of the transmission protocol in such a way that, in addition to a "push functionality" with the implementation of the "Calling Line Identification(CLI)" feature known as "Calling Line Identification Presentation (CLIP)", a "pull functionality" is created for which the CLIP function is no longer required. As a large number of telecommunications devices do not possess said CLIP functionality, the "pull functionality" offers the user of these devices the possibility of being able to download various information content (e.g. images, ringtones, weather reports, etc.) from the service center by user input. In some cases automatic downloading of content by the device is also conceivable.

The invention defines a complete solution for mapping the SMS service in the fixed network to every fixed network line, regardless of whether or not this line has CLIP functionality.

All in all the invention, whereby the requesting of information content from the service center by the telecommunications device and the delivery of the information content to the telecommunications device by the service center take place via a single telecommunications call, gives rise to the following advantages compared to the prior art:

(i) CLIP function no longer necessary for downloading information content,
(ii) the call is released by the telecommunications device,

which means that no costs are incurred by the service center, these being charged to the user of the telecommunications device alone,

(iii) the service center no longer needs to set up a call, thereby reducing service center complexity and producing a cost benefit for the service center operator,

(iv) the service center can be operated in a location-independent manner in relation to the telecommunications device, thereby enabling the service center to be located abroad, while the telecommunications device is operated in the home country,

(v) a simple operating surface on the telecommunications device for downloading information content is possible, because the relevant user interface can be implemented independently from the other SMS user interface,

(vi) from the service center operator's standpoint, the costs of downloading (requesting and delivering) can be charged via a directory number specifically provided for the purpose,

(vii) for downloading, any CLIR (Calling Line Identification Restriction) function present does not need to be activated.

The development of the invention in Claims 2 and 3 and in Claims 11 and 12 is advantageous because the telecommunications device relinquishes control of the telecommunications call to the service center on commencement of the second session, thereby eliminating unnecessarily long second sessions at the telecommunications device user's expense.

Other advantageous developments of the invention are set forth in the remaining sub-claims.

An example of the invention will be explained with reference to FIGURES 4 and 5 in which:

FIGURE 4 shows the message flowchart for the requesting of information content by a telecommunication device from a service center, in particular a Short Message Service Center, and the delivery of the requested information content to the telecommunications device by the service center, in particular the Short Message Service Center, via a telecommunications network,

FIGURE 5 shows the basic design of the telecommunications device for the requesting of information content from the service center, particularly the Short Message Service Center, by the telecommunications device and delivery of the requested information content to the telecommunications device by the service center, in particular the Short Message Service Center, according to FIGURE 4 via a telecommunications network.

FIGURE 4 shows with reference to a message flowchart how a telecommunications device TKG that has been modified compared to the TKG' in FIGURES 1 to 3 requests information content - e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc. - from a service center SZ that has been modified compared to the service center SZ' in FIGURES 1 to 3, in particular a Short Message Service Center. For this purpose the telecommunications device TKG first sets up a call to the service center SZ. To this end it transmits, as in FIGURE 1, the first message M0 with message content "CALL SETUP" to the service center SZ. On receiving this first message M0, the service center SZ assumes the first operating state "OFF-HOOK".

In this operating state the service center SZ then transmits, as in FIGURE 1, the second message M1 with message content "DLL_SMS_EST" (Data Link Layer_Short Message Service_ESTablished) to the telecommunications device TKG,

thereby initiating a first session SI1. With the second message M1 the service center SZ informs the telecommunications device TKG that a DLL (Data Link Layer) connection exists.

In the first session SI1, on receiving the second message M1, the telecommunications device TKG transmits the first service message SN1, in particular a short message, to the service center SZ using the third message M2 and message content "DLL_SMS_DATA[SUBMIT]" (Data Link Layer_Short Message Service_DATA[SUBMIT]) as in FIGURE 1. With this first service message SN1 the telecommunications device TKG requests from the service center SZ quite specific information content required by the user of the telecommunications device TKG - e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc.

To acknowledge that it has received the first service message SN1 from the telecommunications device TKG, the service center SZ sends, again as in FIGURE 1, the fourth message M3 with message content "DLL_SMS_ACK[SUBMIT_REP]" (Data Link Layer_Short Message Service_ACKnowledge[SUBMIT_REPeated]) to the telecommunications device TKG. In this fourth message M3 the content of the first service message SN1 is sent back by the service center SZ as a repetition to acknowledge receipt of the first service message SN1. In this way the telecommunications device TKG can check whether the first service message SN1 sent with the third message M2 has been completely and correctly received by the service center SZ.

If this is the case, this completes the requesting of information content performed with the third message M2. Otherwise, the first service message SN1 transmitted with the third message M2 is re-transmitted. If this transmission attempt also fails, the telecommunications device TKG, like the

telecommunications device TKG' according to FIGURE 1, has two options (likewise not shown in FIGURE 4):

Either it attempts to re-transmit until transmission has been successful or it aborts the transmission procedure. The result of the latter is that the telecommunications device TKG cannot request the information content in the current first session SI1 and, if required, it must initiate a completely new procedure encompassing the first session SI1 (request session) immediately after aborting or with a time delay.

When the telecommunications device TKG has ascertained that the sent first service message SN1 has been completely and correctly received by the service center SZ, the telecommunications device TKG does not, as in FIGURE 1, send the fifth message M4 with message content "DLL_SMS_REL" (Data Link Layer_Short Message Service_RELease) to the service center SZ, which would have caused the first session SI1 to be released and finally the call to be cleared down by the telecommunications device TKG. Instead it sends, as in FIGURE 2, the sixth message M5 with the same message content "DLL_SMS_EST" (Data Link Layer_Short Message Service_ESTablished) as in the second message M1 to the service center SZ. With the sixth message M5, the telecommunications device TKG not only notifies the service center SZ that the DLL (Data Link Layer) connection still exists, but there also takes place a direct changeover from the first session SI1, the request session, to the second session SI2, the delivery session, without the existing (old) call being cleared down and another (new) call being set up as in FIGURES 1 and 2.

In other words:
With the transmission of the sixth message M5 by the telecommunications device TKG, without the fifth message M4

being previously transmitted by same, the first session SI1 is terminated and the second session SI2 is simultaneously initiated during the existing call, without the existing call having to be cleared down and a new call set up.

In the second session SI2 thus initiated, on receipt of the sixth message M5, the service center SZ re-transmits, as in FIGURE 2, the second service message SN2, in particular again a short message, to the telecommunications device TKG with the seventh message M6 and message content "DLL_SMS_DATA[DELIVER]" (Data Link Layer_Short Message Service_DATA[DELIVER]). With this second service message SN2, the service center SZ delivers the information content requested by the telecommunications device TKG - e.g. texts, multimedia content such as audio/video data (ringtones, screensavers), graphics, programs, etc.

If the service center SZ does not have the information content requested by the telecommunications device TKG (this eventuality is not shown in FIGURE 4), instead of the seventh message M6 it transmits a warning to the telecommunications device TKG, informing the device of this fact and advising it that the existing second session SI2 will be released and the call terminated.

To acknowledge that it has received the second service message SN2 from the service center SZ, the telecommunications device TKG sends, as in FIGURE 2, the eighth message M7 with message content "DLL_SMS_ACK[DELIVER_REP]" (Data Link Layer_Short Message Service_ACKnowledge[DELIVER_REPeated]) to the service center SZ. In this eighth message M7 the content of the second service message SN2 is sent back by the telecommunications device TKG as a repetition to acknowledge receipt of the second service message SN2. In this way the service center SZ can check whether the second service message SN2 sent with the

seventh message M6 has been completely and correctly received by the telecommunications device TKG.

If this is the case, this completes the transmission of information content performed with the seventh message M6. Otherwise, the second service message SN1 transmitted with the seventh message M6 is re-transmitted. If this transmission attempt also fails, the service center SZ as according to FIGURE 2 has two options (not shown in FIGURE 4):

Either it attempts to re-transmit until transmission has been successful or it aborts the transmission procedure. The result of the latter is that the telecommunications device TKG has not received the requested information content in the current second session SI2 and, if required, it must initiate a completely new procedure encompassing the first session SI1 (request session) and the second session SI2 (delivery session) immediately after aborting or with a time delay.

If the amount of information content to be delivered is so large that a second service message SN2 is insufficient, in terms of the maximum capacity transmittable with the message, to transit the information content to be delivered, the partial delivery handled with the seventh message M6 and the eighth message M7 is repeated until the service center SZ has transmitted the second service message SN2 in the second session SI2, as in FIGURE 2, with the ninth message M8 and message content "DLL_SMS_DATA[DELIVER]" (Data Link Layer_Short Message Service_DATA[DELIVER]) for the last time for the complete delivery of the information content and until the telecommunications device TKG has sent a tenth message M9 with message content "DLL_SMS_ACK[DELIVER_REP]" (Data Link Layer_Short Message Service_ACKnowledge[DELIVER_REPeated]) to the service center SZ to acknowledge that it has received the

last second service message SN2 from the service center SZ.

In this tenth message M9, as in the eighth message M7, the content of the last second service message SN2 is sent back as a repetition. In this way the service center SZ can now finally check whether the second service message SN2 last transmitted with the ninth message M8 has likewise been completely and correctly received by the telecommunications device TKG.

If this is the case, this completes the information content transmission begun with the seventh message M6. If not, the second service message SN2 last transmitted with the ninth message M8 is transmitted once again. If this transmission attempt also fails, the service center SZ again has two options (not shown in FIGURE 4):

Either it attempts to re-transmit until transmission has been successful or it aborts the transmission procedure. The result of the latter is that the telecommunications device TKG has not completely (only partially) received the requested information content in the current second session SI2 and, if required, it must initiate a completely new procedure encompassing the first session SI1 (request session) and the second session SI2 (delivery session) immediately after aborting or with a time delay.

When the service center SZ has established that the transmitted second service message SN2 has been completely and correctly received by the telecommunications device TKG, the service center SZ sends the eleventh message M10, as in FIGURE 2, with the same message content "DLL_SMS_REL" (Data Link Layer_Short Message Service_RELease) to the telecommunications device TKG. With this eleventh message M10 the second session SI2 is released by the service center SZ. After transmission of the

eleventh message M10, which therefore terminates the second session SI2, both the service center SZ and the telecommunications device TKG assume the second operating state "ON-HOOK". This causes the set-up call to be cleared down and delivery by the service center SZ of the message content requested by the telecommunications device TKG according to the invention is complete.

FIGURE 5 shows the basic design of the telecommunications device TKG on the one hand for requesting information content from the service center SZ, in particular the Short Message Service Center, and delivery of the requested information content to the telecommunications device TKG by the service center SZ according to FIGURE 4 via a telecommunications network TKN implemented e.g. as a fixed network FN [Public Switched Telephone Network (PSTN)] or as an Integrated Services Digital Network (ISDN) or as a mobile network.

In order that the telecommunications device TKG can transmit (send and receive) the messages M0, M1...M3, M5...M10 and the two service messages SN1, SN2 shown in FIGURE 4, the telecommunications device TKG, like the telecommunications device TKG' in FIGURE 3, has the central control device ZSE for controlling the functional and operational sequences in the telecommunications device TKG, the user interface BSS and the telecommunications device/service center interface TSSS. In contrast to the telecommunications device TKG' in FIGURE 3, the central control device ZSE of the telecommunications device TKG has evaluation/control means ASM and time monitoring means ZÜM preferably implemented as program modules and forming a functional unit, as indicated by the connection between the two means in FIGURE 5

The user interface BSS again comprises e.g. the typical

operating surface for telecommunications devices, consisting of a keypad, a display and electroacoustic transducers for voice input and voice output. The telecommunications device/service center interface TSSS and the user interface BSS are again each connected to the central control device ZSE. The telecommunications device/service center interface TSSS again additionally has sending means SM and receiving means EM which are likewise connected to the central control device ZSE and via which the telecommunications device TKG is connected to the service center SZ via the fixed network FN.

If the user of the telecommunications device TKG wishes to call up and download user-specific information content such as texts, multimedia content, e.g. audio/video data, graphics, programs, etc. from the service center SZ, he enters appropriate download-initiating commands on the user interface BSS and generates the first service message SN1, e.g. a short message, via the operating surface of the user interface BSS. These commands and the first service message SN1 are interpreted by the central control device ZSE. If the central control device ZSE detects on the basis of this interpretation of the commands and the first service message SN1 that the user of the telecommunications device TKG wishes to establish a telecommunications call TKV to the service center SZ, the telecommunications device/service center interface TSSS and in particular the sending means SM in this interface are controlled by the evaluation/control means ASM in such a way that initially the first message M0 is transmitted via the telecommunications network TKN to the service center SZ, causing the telecommunications call TKV required by the user of the telecommunications device TKG to be set as illustrated in FIGURE 4.

Via this set-up telecommunications call TKV, the messages

M1...M3 shown in FIGURE 4 and corresponding to the first session SI1, including the generated first service message SN1, are then transmitted between the telecommunications device TKG and the service center SZ in the sequence and transmission direction illustrated. For this purpose, depending on which message and whether the first service message SN1 is to be transmitted (sent or received), either the sending means SM or the receiving means EM in the telecommunications device/service center interface TSSS are connected by the evaluation/control means ASM in the central control device ZSE in the telecommunications device TKG to the service center SZ by line connection if the telecommunications network is a fixed network, or by activation of an air interface if the telecommunications network is a mobile network.

If the messages M1... M3 and the first service message SN1 corresponding to the first session SI1 have been transmitted completely and correctly, the checking possibly required for this purpose on the part of the telecommunications device TKG, including generation of the acknowledgment message, being performed by the evaluation/control means ASM in the central control device ZSE, the sixth message M5 has been sent to the service center SZ and therefore direct changeover from the first session SI1, the request session, to the second session SI2, the delivery session SI2, has taken place without the existing (old) call being cleared down and another (new) call set up as in FIGURES 1 and 2, delivery of the information content requested by the user of the telecommunications device TKG by the service center SZ can now commence.

For this purpose the messages M5...M10 shown in Figure 4 and corresponding to the second session SI2, including the second service message SN2 generated by the service center SZ, are transmitted between the telecommunications device TKG and the

service center SZ in the sequence and transmission direction illustrated. For this purpose, depending on which message is to be transmitted (sent or received) and whether the second service message SN2 is transmitted, either the sending means SM or the receiving means EM in the telecommunications device/service center interface TSSS are again connected by the evaluation/control means ASM in the central control device ZSE in the telecommunications device TKG to the service center SZ by line connection if the telecommunications network is a fixed network, or by activation of an air interface if the telecommunications network is a mobile network.

If the messages M5... M10 and the second service message SN2 corresponding to the first session SI1 have been transmitted completely and correctly, the checking possibly required for this purpose on the part of the telecommunications device TKG, including generation of the acknowledgment message, being performed by the evaluation/control means ASM in the central control device ZSE, and if therefore as illustrated in FIGURE 4 both the second session SI2 has been released and finally the telecommunications call TKV between the telecommunications device TKG and the service center SZ has been cleared down, downloading (request and delivery) of the information content required by the user of the telecommunications device TKG from the service center SZ is terminated or complete.

In order that downloading of the information content via the telecommunications call TKV set up by the telecommunications device TKG and chargeable to the user does not incur unnecessary costs for maintaining the telecommunications call TKV set-up, the central control device ZSE of the telecommunications device TKG contains the time monitoring means ZÜM. Said time monitoring means ZÜM enable the duration of the second session SI2, normally 60 seconds, to be

monitored.